



# TARDEC Overview

Tank Automotive Research,  
Development & Engineering Center

Mrs. Jennifer Hitchcock

Director, Research and Technology Integration

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- Provides full life-cycle engineering support and is provider-of-first-choice for all DOD ground combat and combat support vehicle systems.
- Develops and integrates the right technology solutions to improve Current Force effectiveness and provide superior capabilities for the Future Force.

*Ground Systems Integrator  
for the Department of Defense*

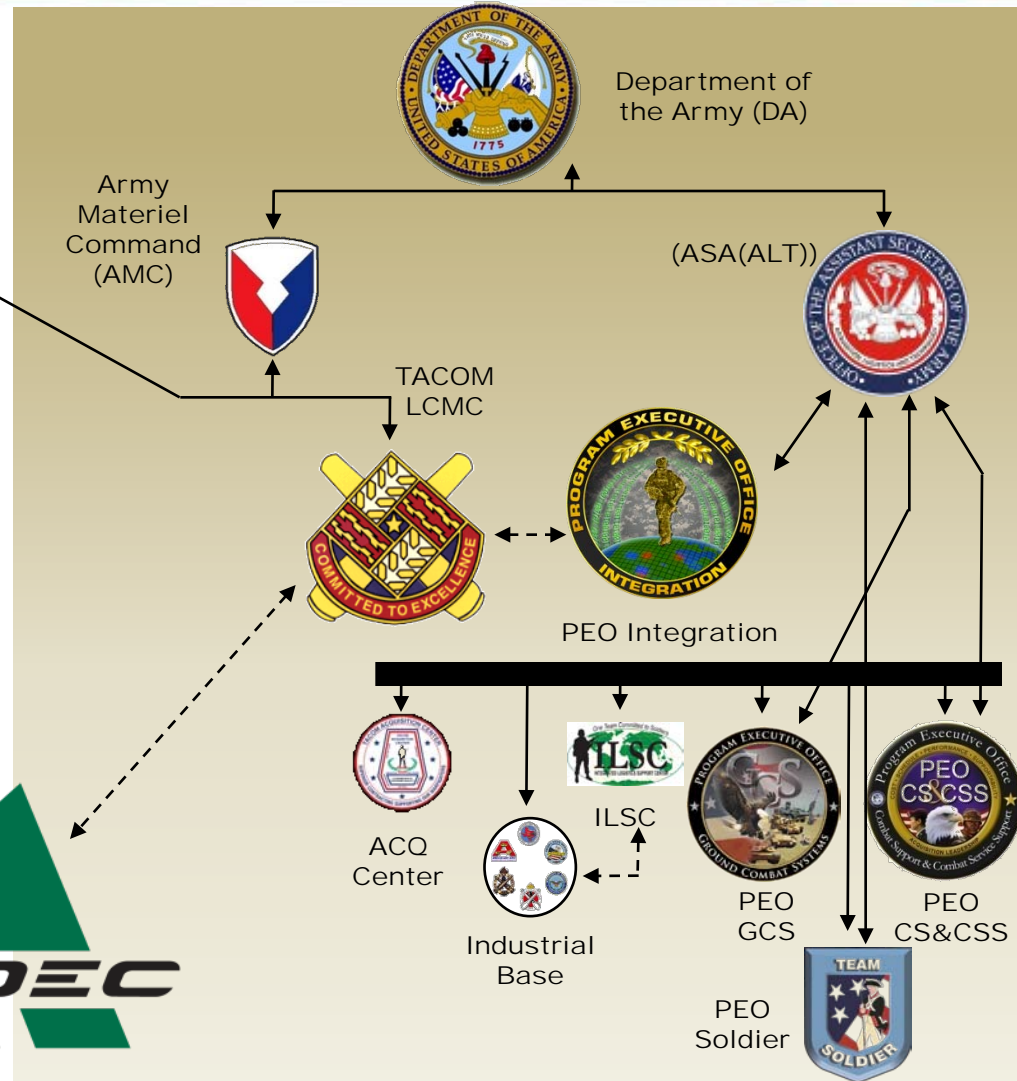
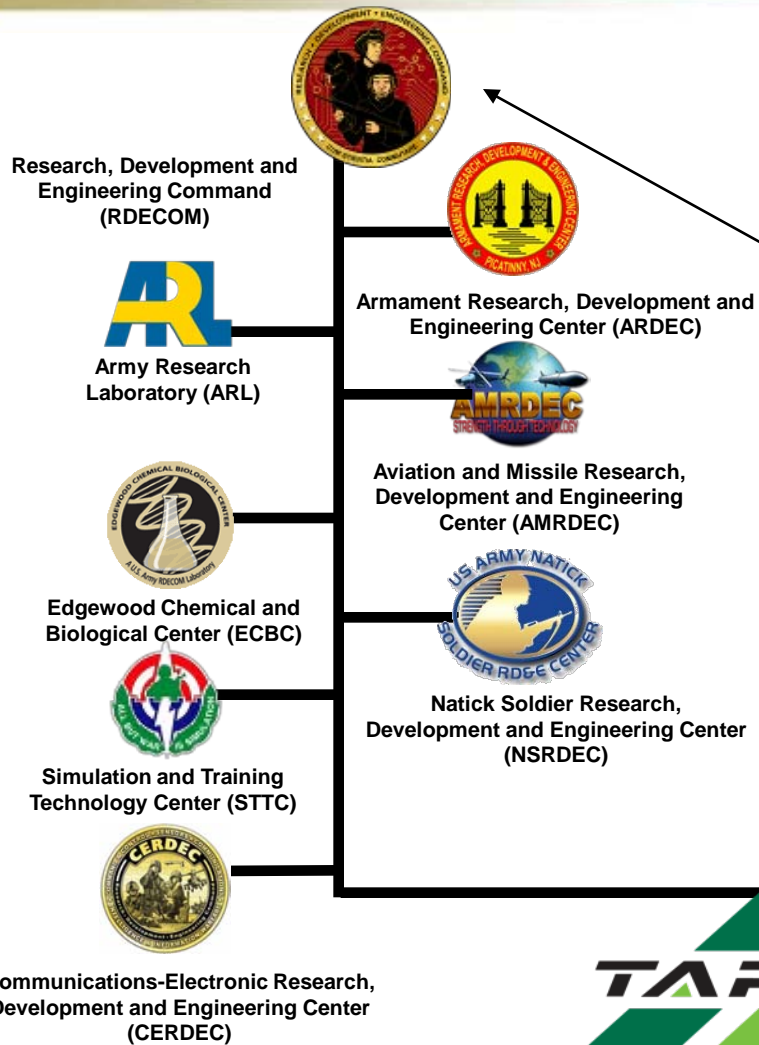


Responsible for Research, Development and Engineering Support to **2,800** Army systems and many of the Army's and DOD's Top Joint Warfighter Development Programs

**TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**



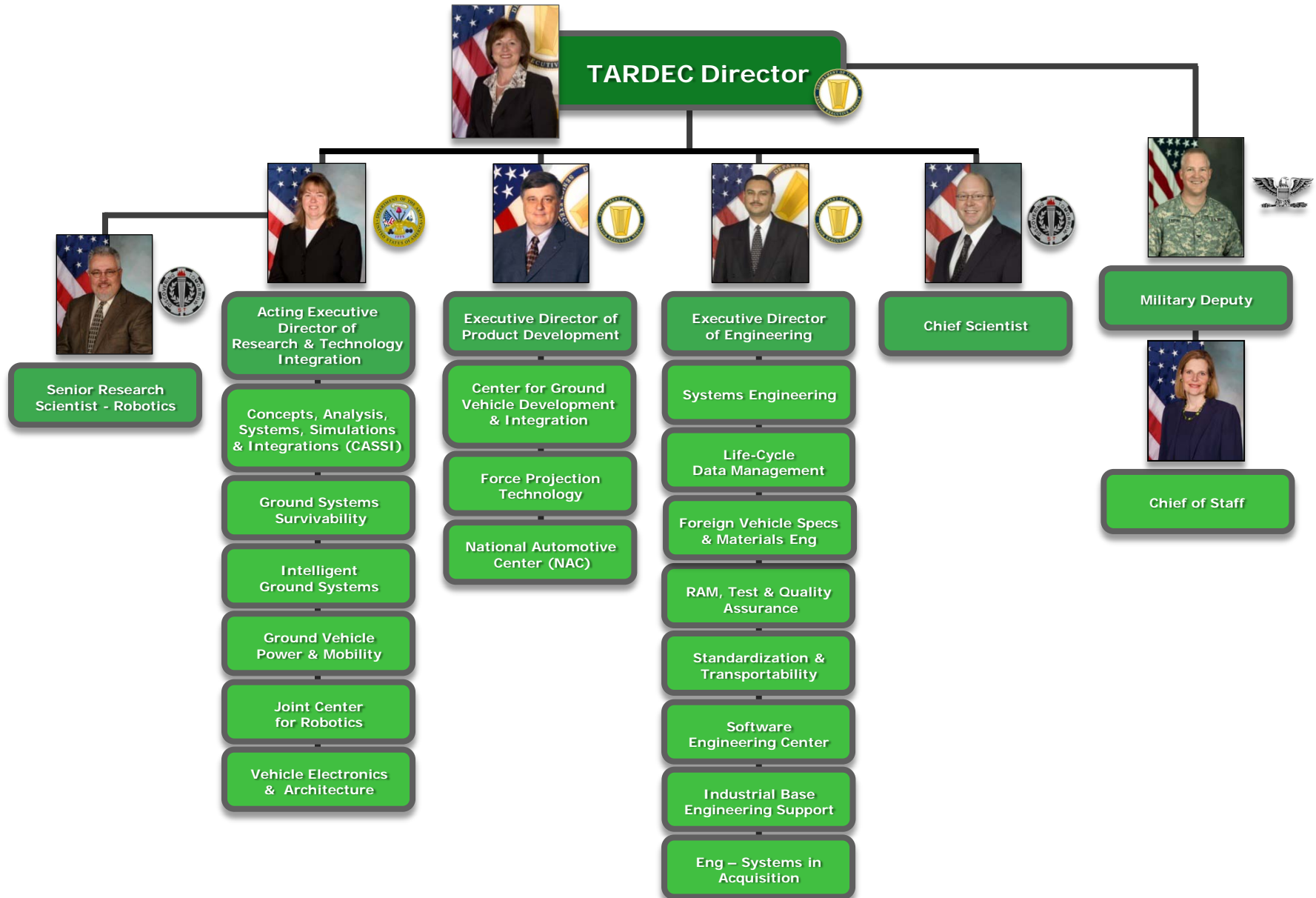




Reach back to over 8,500 Scientists and Engineers

**TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**







## Force Projection

- Fuel & Water Distribution
- Force Sustainment
- Construction Equipment
- Bridging
- Assured Mobility Systems

## Combat Vehicles

- Heavy Brigade Combat Teams
- Strykers
- MRAPs
- Ground Combat Vehicles (Future)



## Tactical Vehicles

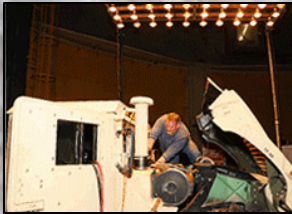
- HMMWVs
- Trailers
- Heavy, Medium and Light Tactical Vehicles

## Robotics

- Technology Components
- Demonstrators
- Military Relevant Test & Experimentation
- Transition & Requirements Development

**TARDEC Engineers Provide Cradle-To-Grave Engineering Support**





## Ground Vehicle Power & Mobility Integration

- Prime Power (Powertrain)
- Non Primary Power
- Power & Thermal Management
- Energy Storage
- Track & Suspension
- Alternative Energy



## Ground Systems Survivability Integration

- Integrated Vehicle Protection Systems
- Active Defense
- Signature Management
- Laser Vision Protection
- Ballistic Protection
- Crew Survivability



## Tactical Movement of Force Projection Technologies

- Water Generation, Purification, Storage, Distribution & Quality Surveillance (QS)
- Petroleum Storage, Distribution & QS
- Material Handling Equipment
- Mechanical Countermine Equipment
- Tactical Bridging

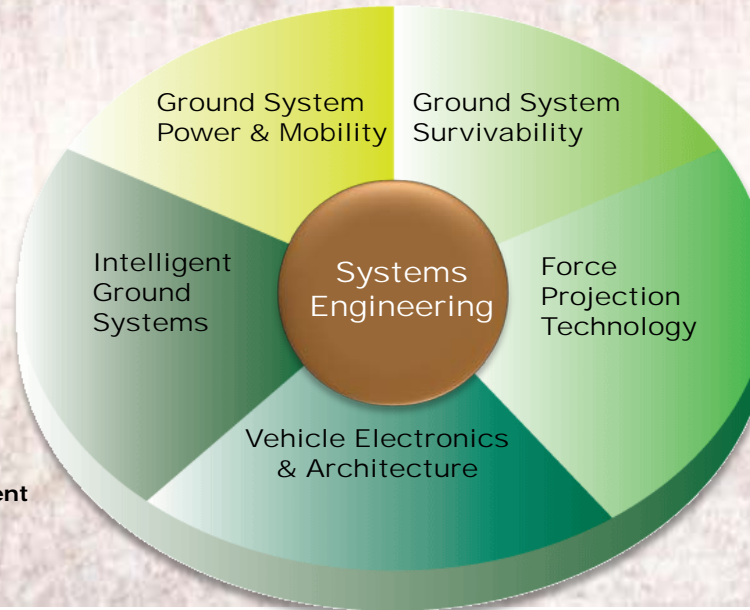
## Specification Development of Force Projection Technologies

- Petroleum, Oils & Lubricants Technology
- Alternative Fuels



## Maturation of Intelligent Ground Systems

- Autonomous Robotics Systems
- Safe Operations Technologies
- Indirect Vision Technologies
- Unmanned Systems Technology Development
- 360° Situational Awareness Technologies
- Soldier Machine Interfaces
- Connected Vehicles



## Vehicle Electronics & Architecture Integration

- Electronics Integration
- Data Architecture
- Condition-Based Maintenance (CBM+)
- Power Architecture/Management



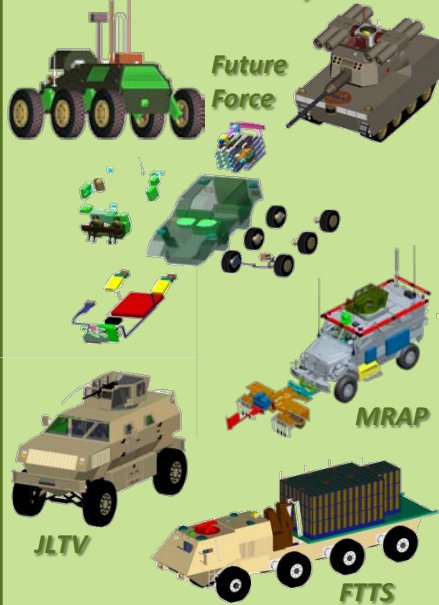
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**A**

**SS**

**I**

## Advanced Concepts



## Analytics



## Hardware & Man-In-The-Loop Simulation



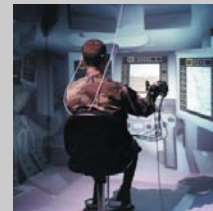
## Integration & Demonstrators



## HPC & Data Management



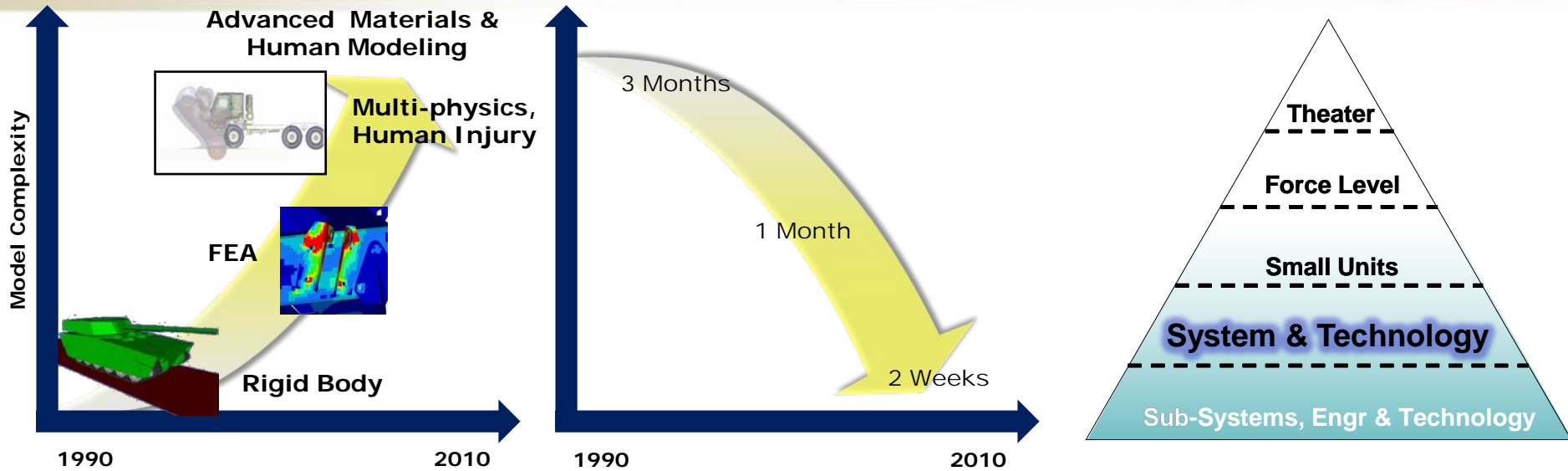
HPC



CAVE



ACE



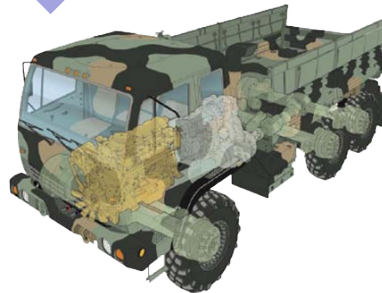
Increasing Demands and Operational Flexibility  
Require Strategic Investments in Key Areas



**Blast Modeling**



**HPC**



**Dynamics, CFD & Reliability**



**Physical Testing**



**Human-in-the-loop**

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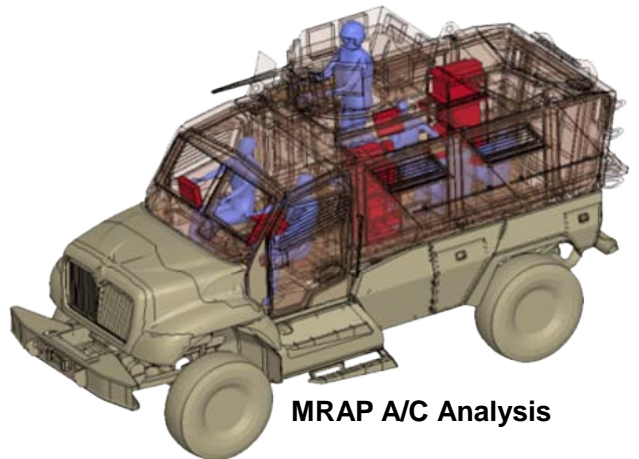


## Vehicle development process expedited by M&S

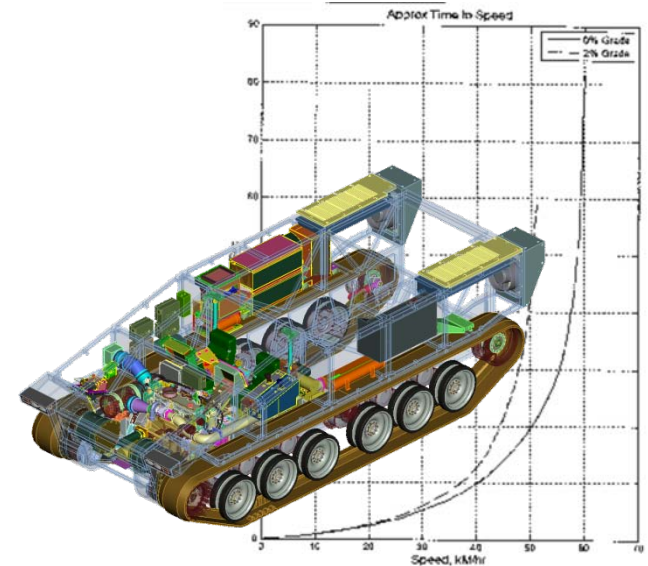


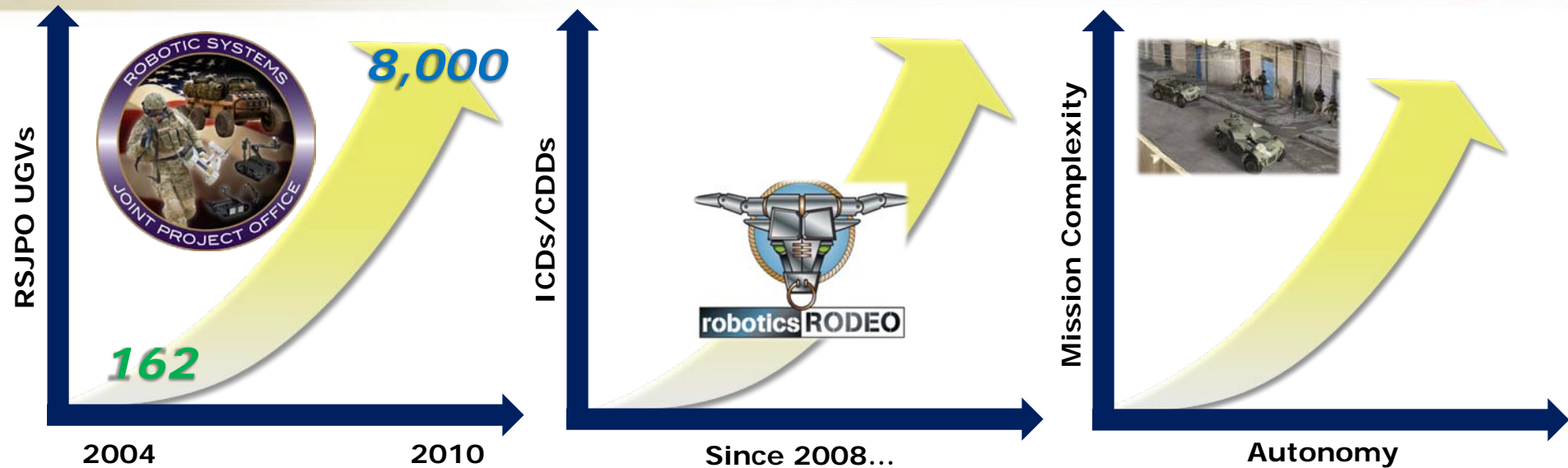
## Supporting the Current Force

## Enabling the Future Fight



MRAP  
Characterization  
& Testing





Increasing Demands and Operational Flexibility  
Require Strategic Investments in Key Areas



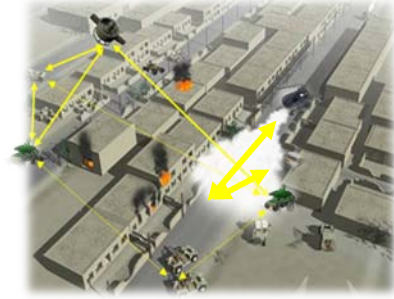
**Reliable operations**



**Intelligent Control**



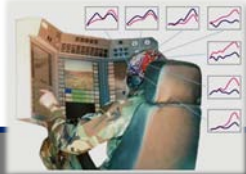
**Lighten the Load**



**Collaborative  
Interoperability**

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Transition

Requirements

Concepts

Analysis

Component Development

Component Testing

System Integration

Virtual Proving Ground

Vehicle Testing/Demo

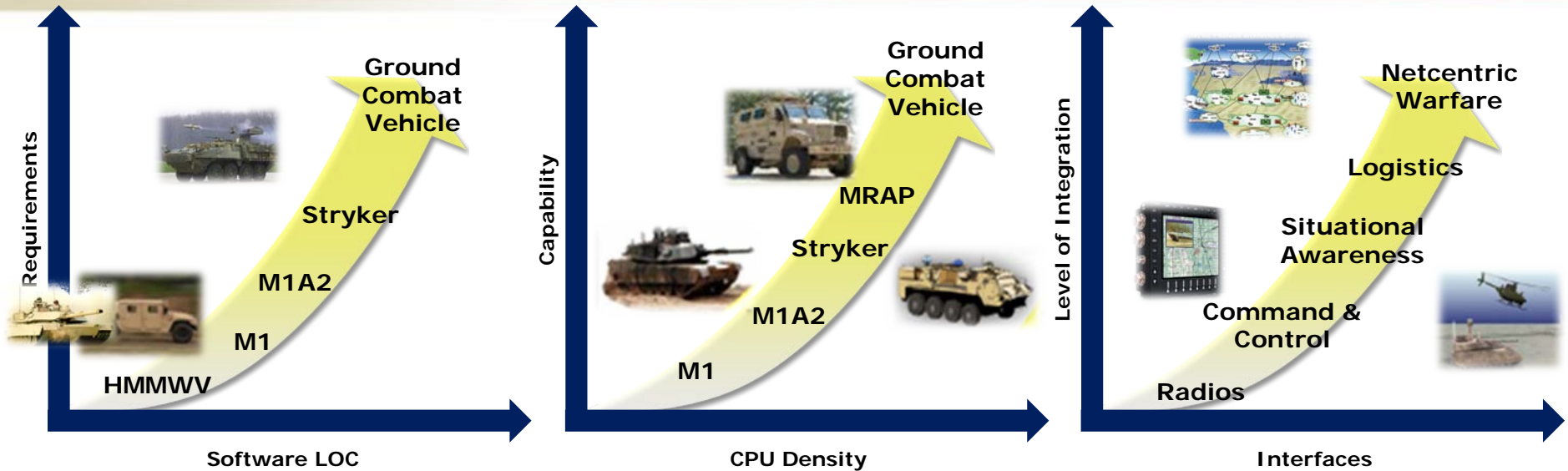
## Supporting the Current Force



## Enabling the Future Fight



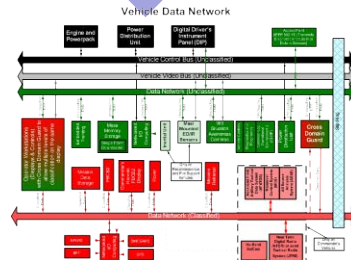
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Increasing Demands and Operational Flexibility  
Require Strategic Investments in Key Areas



**Vehicle Networks**



**Architectures**



**Computers**

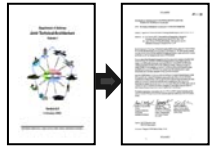


**Software**

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## Full System Lifecycle Support



## Systems Engineering Processes

Requirements

Architectures  
& Standards

Software  
Development

System  
Integration

Testing

Field  
Support

Sustainment

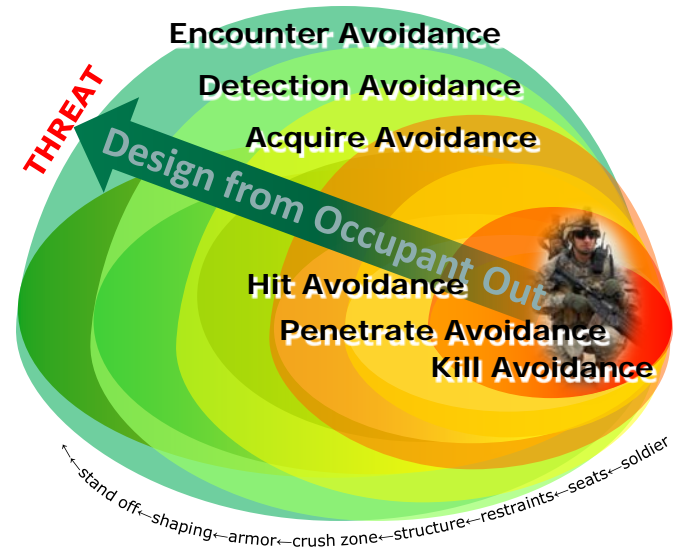
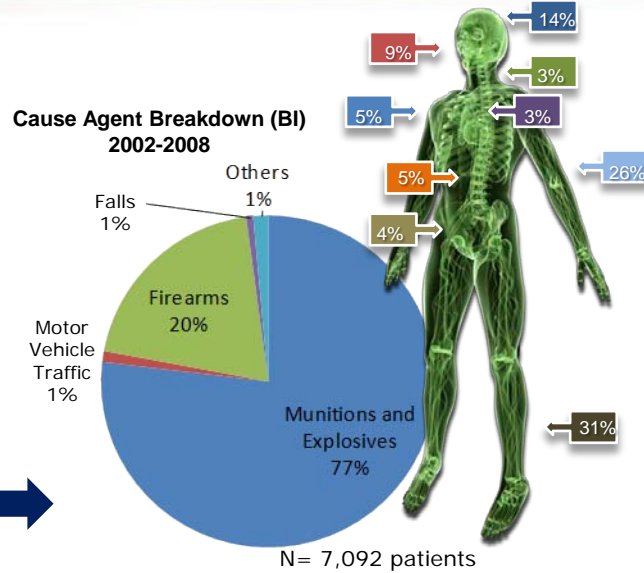
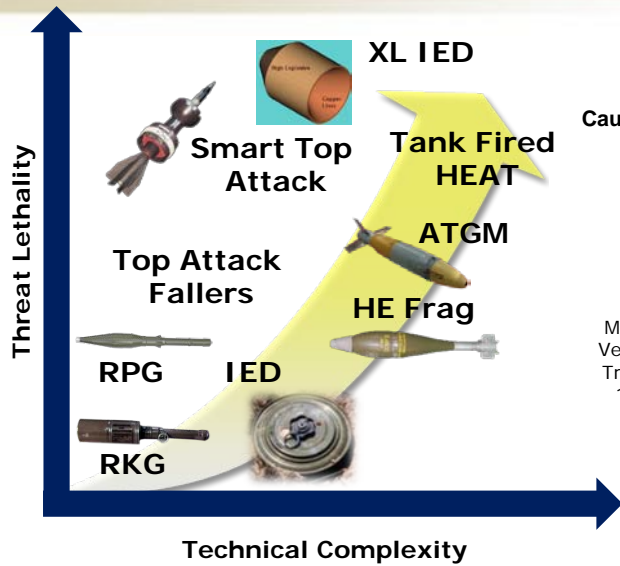
## Supporting the Current Force



## Enabling the Future Fight



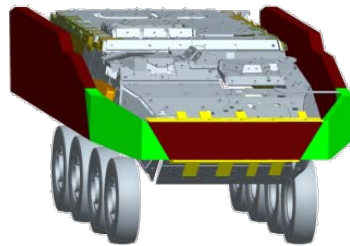
**TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.**



Increasing Demands and Operational Flexibility  
Require Strategic Investments in Key Areas



**Kill Avoidance**



**Penetration Avoidance**



**Hit Avoidance**



**Detection Avoidance**

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The diagram illustrates a five-stage vehicle design process flow:

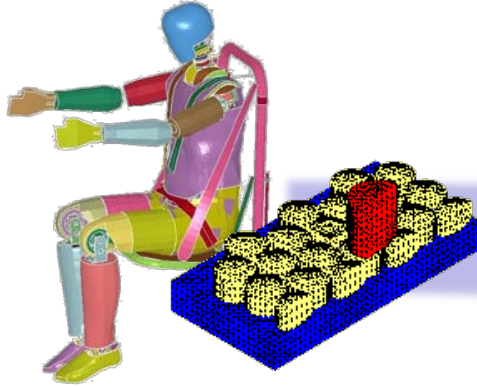
- Requirements Development:** Features a green wireframe human figure with performance metrics (9%, 14%, 3%, 5%, 26%, 4%, 61%) and a blue 'Survivability' label.
- Optimization Modeling:** Shows a grey cloud with a red circle and a blue 'Burden' label.
- Concept Development & Test:** Displays a green vehicle model with red particle impact.
- Vehicle Integration & Design Studies (SWAP-C):** Shows a green vehicle model with yellow components.
- Integrated Product:** Shows the final brown vehicle model.

A large blue arrow labeled 'Transition' points from the first stage to the last.

The top row contains two images. The left image shows a tan Humvee with a mounted machine gun and other equipment on its roof, parked on a dirt road. The right image shows a large, tan armored truck with a cage-like structure on its back, parked in front of a building. The bottom image shows a smaller, tan armored truck with a large, tan rectangular container mounted on its back, parked on a paved surface.

16

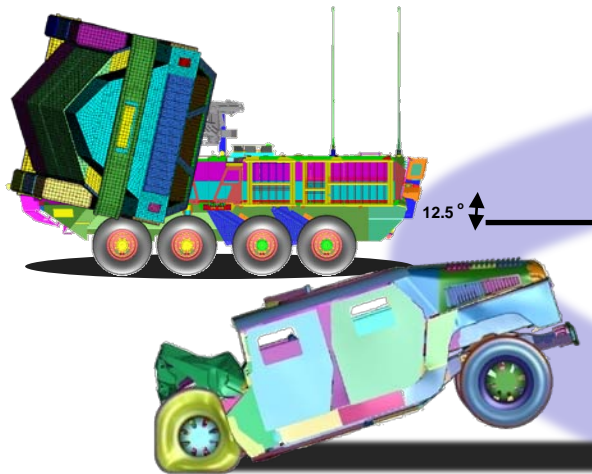
## Outreach & University



## Shaping Requirements



## Laboratories & Facilities



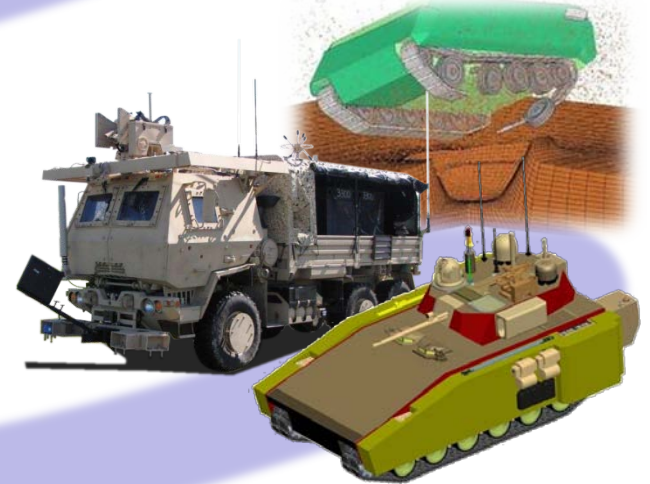
## Building Modeling & Simulation



## International



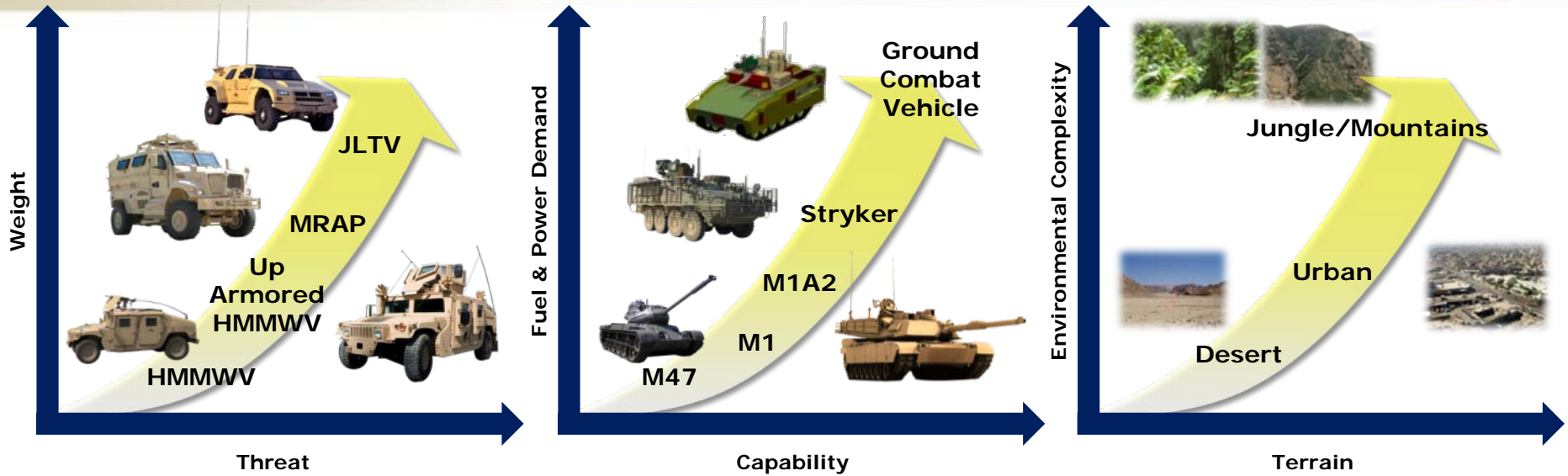
## Component Development



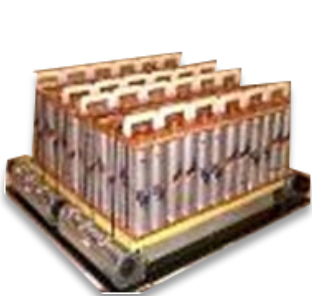
## System Analysis & Prototypes

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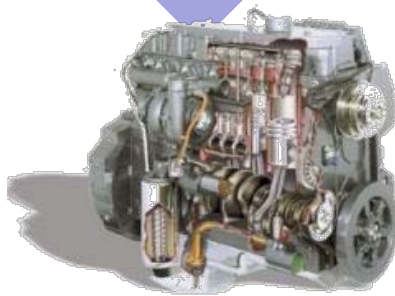




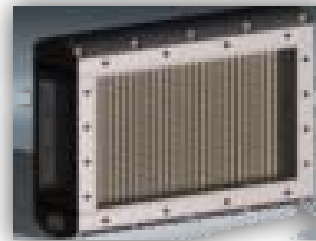
Increasing Demands and Operational Flexibility  
Require Strategic Investments in Key Areas



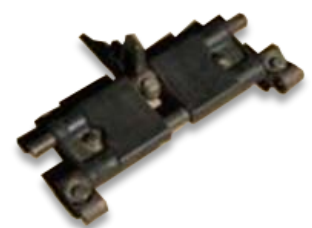
Energy Storage



Power Generation  
& Control



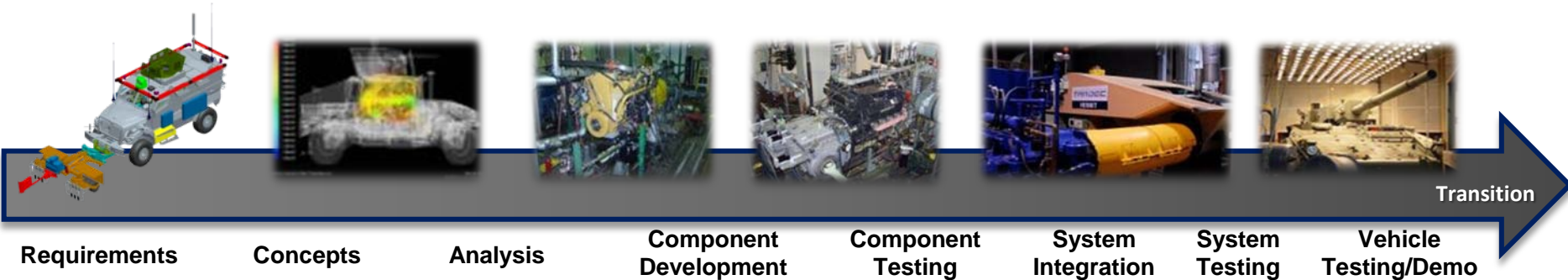
Thermal Management



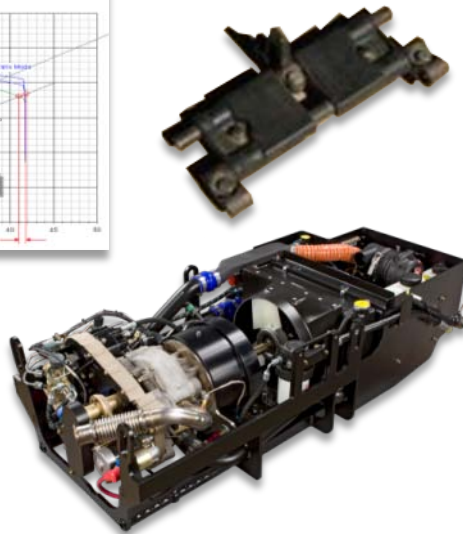
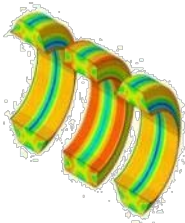
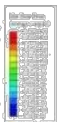
Track & Suspension

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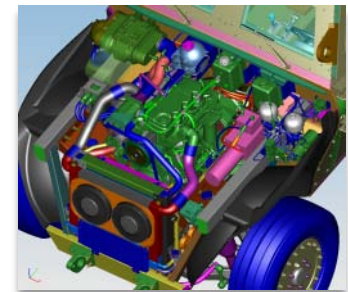
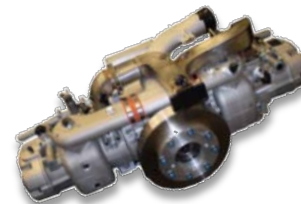
## System Engineering Driving Technology Integration



### Supporting the Current Force



### Enabling the Future Fight

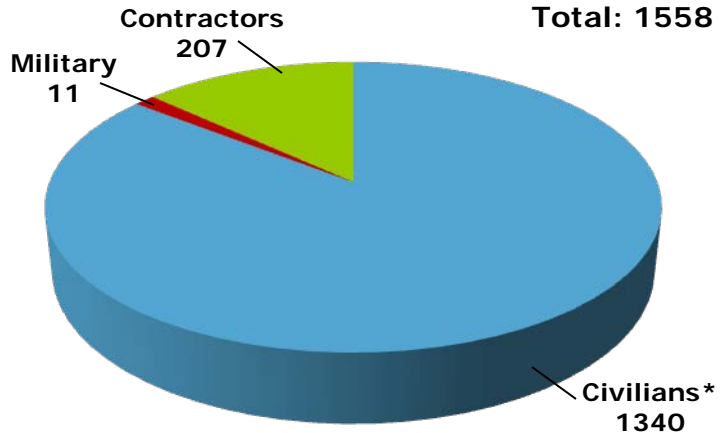


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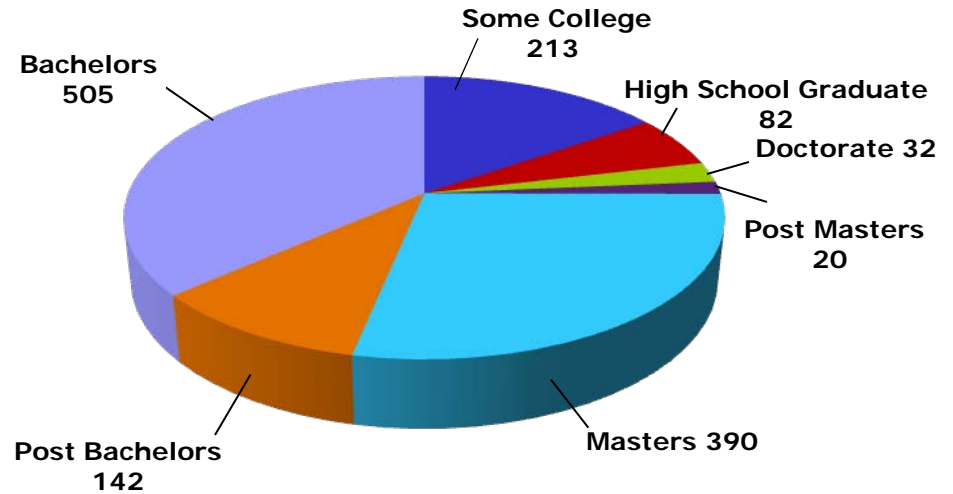
## Total Workforce

Total: 1558



\*Includes permanent/term employees, local interns, STEPs, and local SCEPs (in a pay status).

## Education



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